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Improvised Automatic Lung Ventilation for Use in Disasters

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Background: Large-scale disasters, such as accidental chemical spills or strategic use of nerve gas, may result in great numbers of casualties requiring mechanical ventilation. The number of ventilators required may exceed the supply.

Objective: To develop improvised breathing circuits that extend the capability of a single ventilator to provide ventilation support to several patients during critical emergencies.

Methods: Two types of circuits were assembled from readily available, inexpensive components. One delivers the tidal volume (Vt) directly to the patient and the other does so through a number of secondary circuits in parallel. Both types require an additional source of fresh gas flow (FGF) for each patient. An examination was made of the role of ventilator Vt, inspiratory time, frequency, and FGF on delivered Vt using mechanical lung simulators.

Results: Each circuit type can provide individual patient Vt, inspired oxygen concentration, and positive end-expiratory pressure (PEEP). The secondary circuit configuration is more efficient in terms of FGF usage, but is more complex with respect to mode of operation.

Conclusions: A description is provided of two breathing circuits assembled from easily accessible components. Each can provide automatic ventilation to several patients with a single ventilator during emergencies.

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Intraosseous Infusions through Non-Trochared Needles

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Objective: A pilot study on the feasibility of intraosseous infusions through a non-trochared needle.

Methods: Eight elderly cadavers were penetrated in three locations: sternal; proximal tibia; and distal tibia; with each of three needles: a Frantzen bone marrow aspiration needle; an 18-gauge and a 14-gauge needle. If penetration succeeded, methylene blue was infused.

Results: If penetration succeeded, methylene blue was infused.

Conclusion: An ordinary, non-trochared steel hypodermic needle can be used successfully for intraosseous injection in elderly cadavers.